

BuildingFutures

Sustainable Design Toolkit

Householder Extensions



ENERGY & CLIMATE CHANGE | LANDSCAPE
& BIODIVERSITY | WATER | AIR | NOISE
DESIGN & SAFETY | MATERIALS & WASTE



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> Introduction

The Building Futures Partnership

Building Futures is an initiative run in partnership by Hertfordshire's eleven Local Planning Authorities with support from industry groups and stakeholders. Its purpose is to promote sustainable and high quality development through the planning system in Hertfordshire. It currently does this in three ways:

- Web based guidance for planners, designers, consultants and clients on sustainable design.
- Hertfordshire Building Futures Awards which promotes and rewards high quality and innovative development in the county.
- Hertfordshire Design Review Panel which provides independent and expert design review services for new development in Hertfordshire.

The Sustainable Design Toolkit

Development at all scales brings change to the environment we interact with and rely upon. This change has the capacity to make a sustainable and positive contribution, both today and over the lifetime of the development.

The Sustainable Design Toolkit has been developed by the Building Futures Partnership to improve the communication and understanding of sustainable design so that new development in Hertfordshire achieves sustainable and positive change.

The Sustainable Design Toolkit achieves this by providing a framework of questions and guidance to provoke thought at the early concept stage of development schemes, can structure design and pre-application discussions between stakeholders, and informs design decisions.

The Sustainable Design Toolkit has been shaped by dialogue with built environment professionals and stakeholders in Hertfordshire and the UK, including:

- Hertfordshire's eleven Local Planning Authorities
- Hertfordshire's Local Authority Building Control Group
- BRE Global
- Town and County Planning Association
- Herts & Beds Constructing Excellence Network
- University of Hertfordshire
- Hertfordshire Design Review Panel

The Sustainable Design Toolkit has also been widely consulted on to gain feedback from statutory consultees, the development industry, industry agencies and organisations, local civic and community groups, and other stakeholders.

Richard Thake, Executive Member Environment and Community Safety:

"The toolkit is an exciting addition to the Building Futures initiative and offers a simple framework of questions and engaging advice that places sustainable design and construction at the heart of new development in Hertfordshire. I would strongly advise those involved in bringing forward development in the county to use this valuable toolkit."



> Introduction

How to use the Sustainable Design Toolkit

The Sustainable Design Toolkit can be used at all stages of the design and planning process, as explained below. The Sustainable Design Toolkit should always be read and used alongside relevant national and local planning policy, and in conjunction with any relevant provisions, standards, targets or other requirements set out in policy and legislation.

Concept and pre-planning application stage:

Considering the whole range of sustainable design issues at the early stages of a development proposal, through an iterative and integrated design process, typically helps you achieve lasting sustainable development at similar cost.

The Sustainable Design Toolkit supports this by providing a simple yet methodical framework, together with objective and up-to-date design guidance that clients, applicants and the Local Planning Authority can refer to and use when preparing and discussing design solutions.

Planning application stage:

A clear and consistent method for demonstrating and assessing the sustainable design merits of development proposals is looked-for by both applicants and Local Planning Authorities.

The Sustainable Design Toolkit supports this by providing a simple PDF template that applicants can use to prepare a Sustainable Design Statement that covers all of the necessary design issues in a methodical and integrated fashion. The Sustainable Design Statement can then form part of a planning application (or brief at the early concept/pre-app stage), providing an explanation of the rationale behind the proposed design response.

A Sustainable Design Statement produced using the Sustainable Design Toolkit gives the Local Planning Authority confidence that the applicant has been made



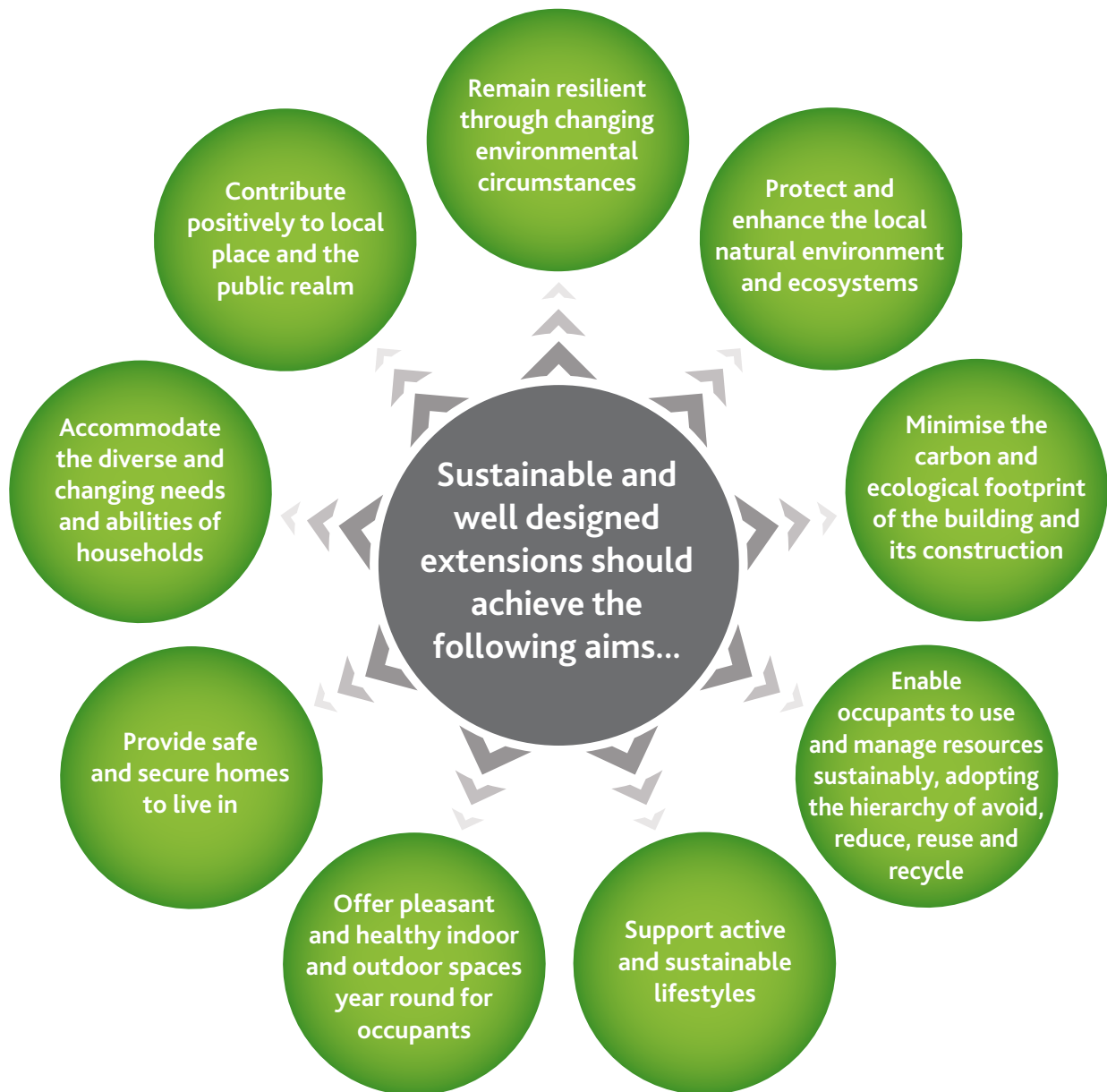
aware of the breadth of sustainable design issues upfront and a level of confidence that relevant sustainable design issues have been considered. The Local Planning Authority can then review the Sustainable Design Statement alongside the guidance contained in the Sustainable Design Toolkit to determine whether those design issues have been adequately addressed, whether the applicant's design rationale is sound, and whether the proposed design solution is appropriate when considered alongside all relevant policies.

Construction stage:

The Sustainable Design Toolkit also contains guidance that project managers and contractors can use to ensure detrimental impacts are avoided or mitigated during the construction and post-completion phases of developments, for example on protecting and maintaining important habitats during and after construction.



> Design Aims & Outcomes





> Your Development Proposal

Project details

Please work through and complete all the relevant boxes and questions. Once you have completed all sections and relevant questions, click on the 'Save Sustainable Design Statement' button on the right to save a PDF statement which can be used during pre-application discussions or form part of your planning application. You can save this PDF at any time and return to it later.

**Save Sustainable
Design Statement**



Client name

Project name/reference

Agent name (if applicable)

Name of other agents/consultants (if applicable)

Address of project

Please provide a brief description of the development



> Your proposal

Sustainable Design Summary

Briefly summarise how your proposal will achieve the design aims and outcomes on page 4, outlining any key

constraints, and set out any alternative options that were discounted and the reasons why.



> Your proposal

Energy & Climate Change

Q1

How will the extension contribute to reducing energy demand for heating, lighting and cooling within the home?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource
www.hertslink.org/bfintranet/retrores

Energy & Climate Change Case Studies
www.hertslink.org/bfintranet/energy1/casestud

CASE STUDIES:

SuperHomes
www.superhomes.org.uk

Energy & Climate Change Case Studies
www.hertslink.org/bfintranet/energy1/casestud

STANDARDS AND POLICY:

Building Regulations Part F & L
www.planningportal.gov.uk

Passivhaus and EnerPHit Standard: Certification for refurbished buildings
www.passivhaus.org.uk

BREEAM: Refurbishment and Fit-Out Technical Standard
www.breeam.com

OTHER RESOURCES:

Building Futures Retrofit Database - companies that provide retrofit services and solutions in Hertfordshire
www.hertfordshire.gov.uk/ufs/ufsmain?formid=ENV_BF_RETROFIT

Energy Saving Trust
www.energysavingtrust.org.uk

LABC Hertfordshire Guide to Extending Your Home 2011
www.extendingyourhome.com/hertfordshire/

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Energy & Climate Change

Q2

What energy efficiency solutions will be used to further reduce energy demand?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource

www.hertfordshire.gov.uk/ufs/ufsmain?formid=ENV_BF_RETROFIT

Energy & Climate Change Solutions

www.hertslink.org/bfintranet/energy1/solutions

Climate Change Adaptation solutions

www.hertslink.org/bfintranet/climateadapt

CASE STUDIES:

SuperHomes

www.superhomes.org.uk/

Energy & Climate Change case studies

www.hertslink.org/bfintranet/energy1/casestud

STANDARDS AND POLICY:

Building Regulations Part J & L

www.planningportal.gov.uk

OTHER RESOURCES:

The Energy Saving Trust: Product Performance

www.energysavingtrust.org.uk

LABC Hertfordshire Guide to Extending Your Home 2011

<http://www.extendingyourhome.com/hertfordshire/>

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Energy & Climate Change

Q3

Where relevant, how have renewable energy technologies been integrated into the design?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource

www.hertfordshire.gov.uk/ufs/ufsmain?formid=ENV_BF_RETROFIT

Energy & Climate Change Solutions

www.hertslink.org/bfintranet/energy1/solutions

CASE STUDIES:

SuperHomes

www.superhomes.org.uk/

Energy & Climate Change case studies

www.hertslink.org/bfintranet/energy1/casestud

STANDARDS AND POLICY:

Building Regulations Part J

www.planningportal.gov.uk

Renewable energy incentives including the Domestic Renewable Heat Incentive (RHI) and Feed-In Tariff (FIT)

www.ofgem.gov.uk

The Microgeneration Certification Scheme

www.microgenerationcertification.org

OTHER RESOURCES:

National Biofuel Supply Database:

www.woodfueldirectory.org

Local Government Association: Compare Renewables

<http://www.local.gov.uk/search?q=compare%20renewables>

Energy Savings Trust

www.energysavingtrust.org.uk

LABC Hertfordshire Guide to Extending Your Home

www.extendingyourhome.com/hertfordshire

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Energy & Climate Change

Q4

How will the extension and home be made resilient to climate change and reduce its contribution to external overheating?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource

www.hertslink.org/bfintranet/retrores

Energy & Climate Change Case Studies

<http://www.hertslink.org/bfintranet/energy1/casestud/>

Climate Change Adaptation solutions

<http://www.hertslink.org/bfintranet/climateadapt/18652826/>

CASE STUDIES:

SuperHomes

www.superhomes.org.uk/

Energy & Climate Change case studies

www.hertslink.org/bfintranet/energy1/casestud

Climate Change Adaptation case studies

www.hertslink.org/bfintranet/climateadapt/18652908

STANDARDS AND POLICY:

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire/

Green Roof Code

www.greenroofcode.co.uk

LivingRoofs

www.livingroofs.org

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Landscape & Biodiversity

Q1

Where a new extension impacts on existing habitats, what mitigation measures will be put into place?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Landscape & Biodiversity solutions
www.hertslink.org/bfintranet/landbio

STANDARDS AND POLICY:

Conservation of Habitats and Species Regulations 2010

When dealing with cases where a European Protected Species may be affected, the planning authority has a statutory duty under the Habitats Regulations to have regard to the requirements of the Habitats Directive, and the three tests that it sets out:

- the activity or development must be for imperative reasons of overriding public interest or for public health and safety;
- there must be no satisfactory alternative;
- favourable conservation status of the species must be maintained.

www.gov.uk/organisations/natural-england

British Standard 5837:2012 Trees in relation to design, demolition and construction

shop.bsigroup.com

British Standard 3998: 2010

Recommendations for Tree Work – Best practice for arboricultural/tree surgery works.
shop.bsigroup.com

Trees can be legally protected by Tree Preservation Orders (TPO), Conservation Areas (CA), Planning Conditions or Restrictive Covenants. Where it is proposed to carry out works to trees covered by a TPO or CA notice must be given to the Local Planning Authority.

Failure to protect hedgerows and trees can result in significant fines - up to £20,000 per tree.

www.trees.org.uk/Help-Advice/Public/A-brief-guide-to-legislation-for-trees

OTHER RESOURCES:

Landscape Institute's database of landscape practices

www.landscapeinstitute.co.uk/registeredpractices/search.php

Hertfordshire Landscape Character Area Statements

www.hertfordshire.gov.uk/services/leisculture/heritage1/landscape/hlca/lcacoll/

CIEEM professional directory of ecological consultants

www.cieem.net/members-directory

Hertfordshire Environmental Records Centre

www.hercinfo.org.uk

Planning for Biodiversity Toolkit

www.biodiversityplanningtoolkit.com

Green Roof Code

www.greenroofcode.co.uk

Living Roofs

www.livingroofs.org

UK Rain Gardens Guide

www.raingardens.info



> Your proposal

Water

Q1

How will the consumption of water be reduced?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource

www.hertslink.org/bfintranet/retrores

Water solutions

www.hertslink.org/bfintranet/water1

Climate Change Adaptation solutions

www.hertslink.org/bfintranet/climateadapt

CASE STUDIES:

Water case studies

www.hertslink.org/bfintranet/water1/casestud/

Climate Change Adaptation case studies

www.hertslink.org/bfintranet/climateadapt/18652908

OTHER RESOURCES:

Waterwise

www.waterwise.org.uk

The Water Calculator

www.thewatercalculator.org.uk

Bathroom Manufacturers Association's Water Efficient Product Labelling Scheme

www.water-efficiencylabel.org.uk

LABC Hertfordshire Guide to Extending Your Home 2011

<http://www.extendingyourhome.com/hertfordshire/>

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Water

Q2

How will surface water runoff be managed sustainably?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Retrofit Resource

www.hertslink.org/bfintranet/retrores

Water solutions

<http://www.hertslink.org/bfintranet/water1/solutions/>

Climate Change Adaptation solutions

www.hertslink.org/bfintranet/climateadapt

Landscape & Biodiversity solutions:

www.hertslink.org/bfintranet/landbio

CASE STUDIES:

Water case studies

www.hertslink.org/buildingfutures/water1/casestud

Climate Change Adaptation case studies

www.hertslink.org/bfintranet/climateadapt/18652908

STANDARDS AND POLICY:

General Permitted Development Order provisions on hard surfacing

www.planningportal.gov.uk

Flood Risk Assessments (FRA) are required when a planning application is submitted.

This requirement is set out in the Government's policy on development and flood risk as stated in the National Planning Policy Framework (NPPF).

www.environment-agency.gov.uk

www.environment-agency.gov.uk

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire/

Green Roof Code

www.greenroofcode.co.uk

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Air

Q1

How will air pollutants, dust and other emissions arising from construction be minimised?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Air solutions

<http://www.hertslink.org/bfintranet/air1/solutions/>

CASE STUDIES:

Air case studies

www.hertslink.org/bfintranet/air1/casestud

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Air

Q2

How will good internal air quality be promoted?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Air solutions

www.hertslink.org/bfintranet/air1/solutions

Materials solutions

<http://www.hertslink.org/bfintranet/materials1/solutions/>

CASE STUDIES:

Air case studies

www.hertslink.org/bfintranet/air1/casestud

STANDARDS AND POLICY:

Building Regulations Part F

www.planningportal.gov.uk

OTHER RESOURCES:

BRE provides a simple online guide to the environmental impacts of building materials.

www.bre.co.uk/greenguide

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Noise

Q1

How will construction noise be minimised?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Noise solutions
www.hertslink.org/bfintranet/noise1

CASE STUDIES:

Noise case studies
www.hertslink.org/bfintranet/noise1/cases

STANDARDS AND POLICY:

Code of Considerate Practice
www.ccscheme.org.uk

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011
www.extendingyourhome.com/hertfordshire

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Noise

Q2

What noise attenuation measures will be used in the extension?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Noise solutions

<http://www.hertslink.org/bfintranet/noise1/solutionsland/>

CASE STUDIES:

Noise case studies

www.hertslink.org/bfintranet/noise1/cases

STANDARDS AND POLICY:

Building Regulation Part E

www.planningportal.gov.uk

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire/

Association of Noise Consultants – specialist advice on noise

www.association-of-noise-consultants.co.uk

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Design & Safety

Q1

How will the design respond to the character of the existing home and surrounding area?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Design solutions
<http://www.hertslink.org/bfintranet/designs/18652992/>

Materials solutions
<http://www.hertslink.org/bfintranet/materials1/solutions/>

CASE STUDIES:

Design case studies
<http://www.hertslink.org/bfintranet/designs/18652972/>

STANDARDS AND POLICY:

National Planning Policy Framework
www.communities.gov.uk

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011
www.extendingyourhome.com/hertfordshire/

Historic England: Making Changes to Your Property
www.historicengland.org.uk

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Design & Safety

Q2

How could the extension and home be adapted to meet different needs?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Design solutions

www.hertslink.org/bfintranet/designs

CASE STUDIES:

Design case studies

www.hertslink.org/bfintranet/designs/18652972

STANDARDS AND POLICY:

Building Regulations Part M

www.planningportal.gov.uk

Lifetime Homes

www.lifetimehomes.org.uk

OTHER RESOURCES:

Space in new homes: This research summary supports the case for more space in private homes, to ensure that they are functional, flexible and fit for purpose.

www.designcouncil.org.uk

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Design & Safety

Q3

How will the design promote security and safety?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Design solutions:

www.hertslink.org/bfintranet/designs

Safety solutions:

www.hertslink.org/bfintranet/safety1

CASE STUDIES:

Design case studies

www.hertslink.org/bfintranet/designs/18652972

Safety case studies:

www.hertslink.org/bfintranet/safety1/case

STANDARDS AND POLICY:

Building Regulations Part Q

www.planningportal.gov.uk

OTHER RESOURCES:

LABC Hertfordshire Guide to Extending Your Home 2011

www.extendingyourhome.com/hertfordshire/

Secured by Design is a crime prevention initiative from the UK Association of Chief Police Officers (ACPO).

www.securedbydesign.com

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Materials & Waste

Q1

What sustainable materials will be used?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Materials solutions

<http://www.hertslink.org/bfintranet/materials1/solutions/>

Waste solutions

<http://www.hertslink.org/bfintranet/waste1/solutionsland/>

CASE STUDIES:

Materials case studies

www.hertslink.org/bfintranet/materials1/caseland

Waste case studies

<http://www.hertslink.org/bfintranet/waste1/solutionsland/>

STANDARDS AND POLICY:

OTHER RESOURCES:

BRE Green Guide to Specification

www.bre.co.uk/greenguide

WRAP recycled content tool

www.wrap.org.uk

The Forest Stewardship Council (FSC)

www.fsc-uk.info

Programme for the Endorsement of

Forest Certification schemes

www.pefc.org

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Your proposal

Materials & Waste

Q2

How will waste be avoided, reduced, reused and disposed of sustainably?

Describe your proposed design solution and explain the rationale for it. Please also outline any alternative solutions that have been considered but were discounted and the reasons why.

► Refer to Advice & Guidance

FURTHER INFORMATION

MORE ON SOLUTIONS:

Materials solutions

www.hertslink.org/bfintranet/materials1/caseland

Waste solutions

www.hertslink.org/bfintranet/waste1/solutionsland/

CASE STUDIES:

Materials case studies

www.hertslink.org/bfintranet/materials1/caseland/

Waste case studies

www.hertslink.org/bfintranet/waste1/casestud/

STANDARDS AND POLICY:

Considerate Constructors Scheme

www.ccscheme.org.uk

Building Regulations Part M

www.planningportal.gov.uk

Lifetime Homes

www.lifetimehomes.org.uk

OTHER RESOURCES:

WasteAware Partnership

www.wasteaware.org.uk

BRE Green Guide

www.bre.co.uk/greenguide

GLOSSARY:

www.hertslink.org/bfintranet/gloss



> Next Steps

That's it! All done.

Thank you for considering and responding to the above questions.

Please use the buttons below to print or save this document.

Save your responses

Click here to save your responses so you can print or continue working later.



Print your responses

Click here to print only the relevant pages of this document (Pages 5-25).



Print full document

Click here to print the full document, including Advice & Guidance notes.





> Examples, Solutions & Advice

Energy & Climate Change

Q1

How will the extension contribute to reducing energy demand for heating, lighting and cooling within the home?

◀ View your response to this question

Advice and Guidance

- 1 Improve insulation within the whole house, replace single glazed and blown windows, and draught proof walls, floors, roofs, water tanks, pipes and ducts, service penetrations and external doors throughout the home.
- 2 An open floor plan will allow light to reach through a building.
- 3 Alter the internal layout so that the most frequently used rooms such as live in kitchens and family rooms, are on southerly elevations to make use of natural sunlight and solar energy.
- 4 Minimise windows on northern elevations, or make them smaller to keep out colder northerly winds and reduce heat loss.
- 5 Triple glazing on northerly aspects could be considered as they have excellent thermal performance.
- 6 Southerly facades and window design should make most of natural sunlight and daylight, for example by using large windows, skylights, sun catchers and sun pipes.
- 7 Plant deciduous trees and incorporate shading measures into southerly facing facades, such as overlarge eaves, brise soleil, external shutters and solar control glazing to keep the extension and home cooler in summer months.
- 8 In more modern homes, take the opportunity to improve ventilation either by promoting natural and 'passive' ventilation (e.g. windows on opposite sides of the building linked via corridors and rooms to allow air to move through the building) or mechanical ventilation with heat recovery, taking account of nearby activities which might affect outside air quality, such industrial parks or busy roads.



> Examples, Solutions & Advice

Energy & Climate Change

Q2

What energy efficiency solutions will be used to further reduce energy demand?

◀ View your response to this question

Advice and Guidance

- 1 Energy efficient lighting (e.g. LEDS and CFLS) and lighting controls.
- 2 Improve or replace old and inefficient heating systems with energy efficient and low carbon replacements (e.g. A rated gas boiler).
- 3 Replace, resize and reposition radiators so they heat the home in the most efficient way.
- 4 Flush and filter the central heating system and fit water softeners to central heating and hot water systems.
- 5 Ensure new white goods are AA or A+++ rated.
- 6 Ensure you have internal and/or external space for air drying clothes throughout the year.

Q3

Where relevant, how have renewable energy technologies been integrated into the design?

◀ View your response to this question

Advice and Guidance

- 1 Solar Thermal Panels: Freestanding or integrated, ideally SE to SW facing at 30-45 degrees. They are more suitable where there is high usage of hot water, but a back-up supply is also needed. Evacuated tube panels are generally more costly but more efficient.
- 2 Solar Photovoltaic Panels: Freestanding or integrated into SE to SW facing roofs 30-45 degrees. Various sizes and forms are available, and can be designed to colour match the appearance of conventional slate tiles within Conservation Areas.
- 3 Ground Source Heat Pump: Converts low grade thermal energy from the ground for use in space heating and hot water. GSHP are best suited to underfloor heating systems or where only low temperatures are needed. They can provide cooling during the summer although they require sites with enough land.
- 4 Air Source Heat Pump: Converts low grade thermal energy from the outside air for use in space heating. Can be situated on the ground, fixed to the wall, or on a roof.
- 5 Biomass Boilers/Burners: Wood pellets or chips, as well as logs are used instead of gas or oil. Considered to be carbon neutral but this depends upon where and how biomass material is sourced. Significant storage space and suitable access for deliveries is required. A good alternative in rural areas where gas mains are not available.



> Examples, Solutions & Advice

Energy & Climate Change

Q4

How will the extension and home be made resilient to climate change and reduce its contribution to external overheating?

◀ View your response to this question

Advice and Guidance

- 1 Use water resilient and robust external finishes on the façade that also reflect or reduce the absorption of solar energy (e.g. white render and light paint colours).
- 2 Use oversized eaves and guttering to protect windows and facades from heavy rain.
- 3 Green Roofs or walls can reduce the cooling load of a building help to attenuate heavy rainfall as part of a sustainable drainage system.
- 4 Use deciduous planting and landscaping around the extension and home to provide shelter from heavy rain and high winds, and shading and cooling during summer days.
- 5 Create water features such as ponds to provide cooling during the summer and a habitat for local biodiversity.
- 6 Avoid excessive areas of dark hard surfacing, or balance it with areas of green space and shading.
- 7 If you are in an area of high flood risk, install flood defences such as flood gates and barriers around doors and other susceptible access points.



> Examples, Solutions & Advice

Landscape & Biodiversity

Q1

Where a new extension impacts on existing habitats, what mitigation measures will be put into place?

◀ View your response to this question

Advice and Guidance

- 1 Phase construction works around local species' seasonal patterns of nesting, mating, foraging and hibernation. These can be identified through an ecological survey which will identify the ecological characteristics of the site and what mitigation and enhancement solutions will be required.
- 2 Retain existing bat roosts and integrate new boxes and roosts for birds and bats into the extension's eaves, roof space and facades.
- 3 Create ponds to support birds, amphibians, small mammals and insects.
- 4 Integrate green roofs sown with native wildflower and grass species, and plant small areas of green space around the extension with native wildflower species.
- 5 Retain protected trees and/or consider re-planting existing trees within the garden.



> Examples, Solutions & Advice

Water

Q1

How will the consumption of water be reduced?

◀ View your response to this question

Advice and Guidance

- 1 Use water-efficient, aerated showerheads that can produce water flows that feel far higher than they actually are.
- 2 Fit low flow taps to sinks and baths.
- 3 Fit dual/low flush toilets.
- 4 Incorporate rainwater harvesting to supply free water for flushing, washing and watering the garden. If you have a garden, a simple water butt helps provide free water for irrigation during the summer.
- 5 Design a 'dry garden' using drought tolerant plants
- 6 Ensure new white goods are water efficient - washing machines should use less than 55 litres per cycle. Look for water efficient appliances with the new Water Efficient Product Label - the Waterwise Marque.

Q2

How will surface water runoff be managed sustainably?

◀ View your response to this question

Advice and Guidance

- 1 Rainwater harvesting, such as water butts and more sophisticated measures (an underground tank), can be used to reduce the amount of water flowing into drains and the risk of surface water flooding.
- 2 A green roof will help attenuate storm water run-off.
- 3 Install a soakaway to receive and filter water runoff from the roof and garden area before it then percolates into the ground below. It should be sited at least 5m from the building foundations.
- 4 Using permeable materials for all hard surfacing to allow water to infiltrate into an underlying layer where it is stored and filtered before it infiltrates into the ground.
- 5 Appropriate planting to provide natural drainage and deter soil erosion.



> Examples, Solutions & Advice

Air

Q1

How will air pollutants, dust and other emissions arising from construction be minimised?

◀ View your response to this question

Advice and Guidance

- 1 Locate air polluting activities away from sensitive habitats.
- 2 Dampen and cover aggregate materials on site, and cover skips and vehicles loaded with material.
- 3 Dampening stock piles, and locating them to take account of the prevailing wind and sensitive receptors.
- 4 Seal and complete any earthworks as soon as practicable.
- 5 Using low emission vehicles and plant equipment (particularly on site generators).

Q2

How will good internal air quality be promoted?

◀ View your response to this question

Advice and Guidance

- 1 Use low VOC emitting materials and products, such as water or vegetable oil based paints, linoleum, and carpet made of natural materials (e.g. hemp, seagrass or wool).
- 2 Use furnishings made from solid wood instead of pressed or reconstituted wood, which is often bound with chemicals such as formaldehyde. Alternatively, use seal pressed wood with formaldehyde sealing coatings.
- 3 Take the opportunity to improve ventilation within the whole house, either by promoting natural and 'passive' ventilation (e.g. allowing air move through rooms and corridors via windows on all sides) or mechanical ventilation with heat recovery, taking account of nearby activities which might affect outside air quality, such as industrial parks or busy roads.



> Examples, Solutions & Advice

Noise

Q1

How will construction noise be minimised?

◀ View your response to this question

Advice and Guidance

- 1 Avoid site drilling wherever possible.
- 2 Keep site grinding, cutting and similar noisy activities to a minimum and at appropriate times of the day.
- 3 Avoid vibro-compaction of the ground as much as possible.
- 4 Use off-site manufacturing where possible, such as the cutting of non standard concrete blocks off site under controlled conditions.

Q2

What noise attenuation measures will be used in the extension?

◀ View your response to this question

Advice and Guidance

- 1 Use sound resistant flooring and walling systems.
- 2 Thicker, heavier doors and double/triple glazed windows will provide greater noise insulation.
- 3 Re-position rooms which are less sensitive to noise (play rooms; utility) to act as screens or baffles between noise sensitive rooms and internal or external noise sources.



> Examples, Solutions & Advice

Design & Safety

Q1

How will the design respond to the character of the existing home and surrounding area?

◀ View your response to this question

Advice and Guidance

- 1 Choose an architectural response that relates well to both the character of the existing home and surrounding area.
- 2 Develop a positive relationship with the existing home and neighbouring dwellings – its siting and orientation, form, scale, massing, and interaction with streetscene and building frontages (if applicable).
- 3 Use appropriate, high quality and durable materials and external finishes that help integrate the extension into the existing home, and hard and soft landscaping to help it sit comfortably in the plot and alongside neighbouring dwellings.

Q2

How could the extension and home be adapted to meet different needs?

◀ View your response to this question

Advice and Guidance

- 1 Open plan or flexible floor plates or lightweight, demountable internal construction.
- 2 Foundations to accommodate first floor extensions.
- 3 Garage space that can easily be converted into living space.
- 4 Doorways, floor levels and circulation space within the home and garden areas should be designed for easy access by all abilities and avoid creating trip hazards.



> Examples, Solutions & Advice

Design & Safety

Q3

How will the design promote security and safety?

◀ View your response to this question

Advice and Guidance

- 1 Side extensions should continue active frontages.
- 2 Add screening for private outdoor space.
- 3 Add screening and secure enclosures for outdoor storage areas, e.g. cycle storage and garden furniture/ DIY equipment.



> Examples, Solutions & Advice

Materials & Waste

Q1

What sustainable materials will be used?

◀ View your response to this question

Advice and Guidance

- 1 Use on-site demolition waste and reclaimed materials (e.g. brick/ slate tiles), and recycled materials (e.g. plasterboard).
- 2 Source local and traditional materials where possible as they will usually have fewer 'road miles' and a smaller carbon footprint.
- 3 Use natural materials that are 'carbon neutral' or absorb carbon (low embodied carbon dioxide) e.g. wood, wool and straw/reed. Water and vegetable oil based paints should be used due to their low VOC content.
- 4 Source timber that is Forest Stewardship Council (FSC) certified, or equivalent.

Q2

How will waste be avoided, reduced, reused and disposed of sustainably?

◀ View your response to this question

Advice and Guidance

- 1 Provide construction waste sorting and storage facilities on-site for recycling or future reuse.
- 2 Design the extension with flexible internal space to avoid further demolition when modifying the house.
- 3 Offsite manufactured components can reduce construction time and waste.
- 4 Reuse demolition waste in the construction of the extension, or recover demolition waste such as broken bricks and concrete for on site levelling.